

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

REC'D 02 FEB 2005

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Applicant's or agent's file reference 913528185PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/CA 03/01044	International filing date (day/month/year) 11.07.2003	Priority date (day/month/year) 03.10.2002
International Patent Classification (IPC) or both national classification and IPC H04B10/18		
Applicant NORTEL NETWORKS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.  
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:  

I	<input checked="" type="checkbox"/>	Basis of the opinion
II	<input type="checkbox"/>	Priority
III	<input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/>	Lack of unity of invention
V	<input checked="" type="checkbox"/>	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/>	Certain documents cited
VII	<input type="checkbox"/>	Certain defects in the international application
VIII	<input type="checkbox"/>	Certain observations on the international application

Date of submission of the demand  30.04.2004	Date of completion of this report  31.01.2005
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**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-27 as originally filed

**Claims, Numbers**

1-48 as originally filed

**Drawings, Sheets**

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-48
	No: Claims	
Inventive step (IS)	Yes: Claims	6-13,19-28,30-33,38-43,45-48
	No: Claims	1-5,14-18,29,34-37,44
Industrial applicability (IA)	Yes: Claims	1-48
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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Reference is made to the following documents:

- D1: US 2002/018268 A1 (MEEKER DEREK W ET AL) 14 February 2002 (2002-02-14)  
D2: US-A-5 446 574 (EGNELL LARS ET AL) 29 August 1995 (1995-08-29)

**V.**

1. The document D1, which is considered to be the closest prior art, discloses a method and system for transmitting information via optical signals comprising the following steps and features set out in claims **1** and **14**:

- deriving a compensation function that substantially mitigates the dispersion imparted to the communications signal by the optical communications system (see Pg.3, paragraph 39 and Pg.4, paragraphs 44-57),

- distorting an electrical input signal using the compensation function to generate a predistorted electrical signal (see Pg.3, paragraph 40 and Pg.4, paragraph 59 and Fig.8),

- modulating an optical signal using the predistorted electrical signal to generate a corresponding predistorted optical signal for transmission through the optical communications system (see Pg.4, paragraph 59 and Fig.8).

The subject-matter of claims **1** and **14** therefore differs from this known D1 in that the distortion of the electrical input signal is carried out by a **compensation processor**. However, implementing the compensating function in software (e.g. by a digital filter using a DSP processor) instead of hardware (see D1: paragraphs 45-56) does not add any inventive subject-matter because it is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

Thus, the present application does not meet the requirements of Article 33(3) PCT because the subject-matter of claims **1** and **14** does not involve an inventive step.

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2. Also document D2 (see col.5, lines 6-68), if not disclose, at least render the subject-matter of claims **1** and **14** obvious.
3. Independent product claim **34** compared to claim **14**, presents the following differences:
  - the particularization that the "compensation processor" is a **digital filter** which not only generates a predistorted electrical signal based on the electrical input signal and the compensation function (as in claim **14**) but also additionally calculates successive digital sample values of the predistorted electrical signal,
  - the additional feature of a **digital-to-analog converter (DAC)** for converting each successive digital sample value into a corresponding analog level of the predistorted electrical signal.

However, the particularization of using a **digital filter** as a compensation processor is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill. The use of an additional **digital-to-analog converter (DAC)** it is a matter of normal design procedure.

Thus, claim **34** does also not involve an inventive step (Article 33(3) PCT).

4. The following dependent claims do not appear to contain any additional features which, in combination with the features of **claims 1** or **14** or **34** to which they refer, could form subject matter which meets the requirements in respect of novelty (Article 33(2) PCT) or inventive step (Article 33(3) PCT), the reasons being as follows:

**Claims 2, 3, 16, 17:** the additional features are already known from D1 (see Pg.2, paragraphs 16-17).

**Claims 4, 15, 18, 29, 44:** the additional features of these claims are a matter of normal design procedure.

**Claims 5, 35:** the option to use a digital filter (FFT, FIR, IIR) for processing the electrical input signal instead of a filter implemented in hardware as shown in D1 (see paragraphs 44-56) is a matter of normal design procedure.

**Claims 36, 37:** the additional features are already known from D1 (see Pg.4, paragraph 60).

### **Certain observations on the international application**

The following claims do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined, the reasons being as follows:

a) In claim 34, the technical feature "a digital filter for calculating successive digital sample values of the predistorted electrical signal, based on the electrical input signal and the compensation function" is not clear. It seems that the technical features introducing the "compensation function" and the "predistorted electrical signal" are missing.

b) Although claims 14 and 34 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extend of the protection.

In fact, claim 34 seems to comprise all the features of claim 14 and is therefore not appropriately formulated as a claim dependent on the latter (Rule 6.4 PCT).

c) The relative term "substantially" used in claims 1, 9 has no well-recognised meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear.

### **Certain defects in the international application**

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents D1 to D2 is not mentioned in the description, nor are these documents identified therein.

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